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THE UNIVERSITY OF ALBERTA

A CAI PROGRAM FOR  
COUNSELLOR EDUCATION

BY

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A THESIS

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## Abstract

This study involved the development, implementation and evaluation of a Computer Assisted Instruction (CAI) program for counsellor education. The program instructed counselling students in Rogerian personality theory and client-centered therapy and recorded each student's degree of agreement and interest in counselling with this approach. This information was used as student feedback to assist the counsellor trainees to become more aware of their individual counselling orientations. The results of the study indicated that the students who took the program expressed highly favorable attitudes toward the program. They clearly felt that the program was useful for counsellor education. In addition, the results demonstrated that the program recorded student performance variables such as the degree of agreement with the Rogerian approach. This finding suggested the possibility of establishing empirical data from the administration of this program with a large number of counselling students for more effective student feedback and, also, for further research purposes. The conclusions of this study suggested that CAI has potential benefit for counsellor education and that more research is needed to determine the long term implications for this type of training.





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## CHAPTER I

Purpose of the Study

The purpose of this study was to design, develop, implement and evaluate a Computer Assisted Instruction (CAI) program that would support a counsellor training program. The three major components to the study were:

- i) to teach a course in Rogerian personality theory and client-centered therapy,
- ii) to demonstrate how varied aspects of each student's performance could be recorded by the computer program, and
- iii) to demonstrate how relevant information from the recording process could be used to provide feedback to the individual student to help him compare his own counselling orientation to that of Rogers.

In summary, the basic purpose of this study was the general evaluation of a CAI program for counsellor trainees. The evaluation was conducted mainly from the perspective of the students who took the course.





## CHAPTER II

Need for the Study

Counsellor training programs generally consist of a combination of theory presentation and practicum applications of various counselling orientations (Shapiro and Gust, 1974; Burck et al, 1972). In general, most of the recent literature concerning ccounsellor education programs has been directed towards improvement in the practicum aspect of these programs and little has been said about improving the methods of theory presentation. A recent survey of ccounsellor training programs in selected Canadian universities concluded that "...training programs need to integrate theory and practice." (Guttman, 1973, P. 256). Computer Assisted Instruction (CAI) needs to be evaluated as a possible medium for achieving this integration. If CAI can effectively teach counsellor trainees in the theoretical component of their program, then the ccounselling supervisors will be able to focus more directly on the practical aspect through the use of role-plays, encounter groups and client-simulations. Clearly CAI has demonstrated its potential for effective instruction and some evaluation of this potential should be attempted for counsellor education.

I think computerized instruction could be of some value in the beginning stages of a counsellor's preparation. A little later, I think





experience in an encounter group would be even more preferable, where he begins to feel within himself what it feels like to be understood, and so forth (Rogers, 1976, personal communication).

The need for an adequate theoretical framework for the effective practice of counselling has been noted elsewhere (Guttman, 1973; Penney, 1971). Lister (1967) pointed out the need for assessing as early as possible the trainee's personal relationship with the counselling theories (s)he has to encounter during training. "Within a program, a student's compatibility with various theoretical viewpoints can be considered when he is assigned an advisor or supervisor." (P. 94). Too often, counselling theories are presented to the student without regard to the student's personal viewpoint, thereby leading to the phenomenon of 'theory aversion'. There is a need for counsellor training programs to allow the student to express personal attitudes and values in regard to the counselling approach under consideration so that they may be used as an important part of the trainee's personal and professional development. For example, a student counsellor is likely to have somewhat different attitudes in regard to the approach of Rogers as opposed to that of Skinner. Clearly, there is a need for the evaluation of an approach, as proposed in this study, that would allow the student to express his personal viewpoint in regard to counselling theory and strategy, and to assess his compatibility with the theory under consideration.



An important aspect of counsellor education involves individual feedback to help the student become more aware of his personal orientation to counselling style. Although modern technology is able to greatly assist this feedback procedure, there is some evidence that media, such as videotaping, is somewhat threatening to counsellor trainees (Poling, 1968). Therefore, there is a need to evaluate a procedure of providing student feedback in a fashion which will be non-threatening to the student.

This study showed how an effective CAI program could be used to provide relevant student feedback in a non-threatening manner, and thereby minimized defensiveness on the part of the student. The purpose of this feedback was to assist the trainee to become more aware of his counselling orientation, so as to help him develop his personal style of counselling in the practicum aspect of his training. In addition, each trainee supervisor had additional information available about students from the various scores recorded by the program. In this way, the supervisors could be more effective in assisting their students to develop counselling approaches which better suit the personal needs and orientations of the individual student.

In summary, there existed a definite need for the evaluation of CAI as a means for serving as an effective and feasible medium for the following purposes in counsellor





education:

- i) to teach counselling theory,
- ii) to assist in the potential integration of theory and practice in counsellor education,
- iii) to provide meaningful student feedback in a non-threatening manner, and
- iv) to assist in the personal and professional development of counsellor trainees by increasing self-awareness of counselling orientation.

Because counsellor education focuses upon the counselling student, emphasis was placed upon evaluation of the CAI program from the perspective of the student.





## CHAPTER III

Review of Related Research and Literature

In reviewing the literature associated with ccounsellor training programs, it became clear that technology is likely to play a major role in future ccounsellor education programs (Carkuff, 1972; Havens, 1970). In recent years, computers have been used in a variety of applications in the field of guidance (Sawyer, 1969), although, for the most part, this has been limited to the area of vocational guidance (Havens, 1970; Super, 1970). Vriend (1973) outlined a hypothetical training program for group ccounsellors which suggested possible ccomputer applications for counsellor education in the future. An interesting and potentially useful application of computer technology for counselling education involves client simulations (Cclby et al, 1971; Hummel et al, 1975). This approach concerns the creation of computer programs which simulate client behavior in an initial counselling interview.

Trainees are essentially provided with a 'counselling cadaver', a client on whom repeated 'practice interventions' may be made. Although ccounsellor mistakes may occur, no harm is done to the client, and no ethical quandries develop. Interviews can be standardized for training purposes, or a trainee can make repeated and varied interventions with the client, to study the varying



effect of those interventions. Since the simulations involve specified variables which can be altered, new clients can be defined by rather simple changes in the program's data, so that a training program of successively more difficult clients can be presented to the trainees (Hummel et al, 1973, P.168).

In addition to practicum experience for counsellor trainees, such computerized client simulation offers an excellent research medium to study the decision strategies and processes used by counsellors.

Another potentially promising use of computer technology for counsellor education involves CAI. In this regard, little work has been accomplished to this point. There has been an attempt to use CAI in teaching personality theory to counselling students at the University of Texas and the University of Wisconsin (Sawyer, 1969), although no data is available on the success of these programs.

A few research studies have been carried out on the use of programmed instruction in counsellor education. Carkuff (1972) designed a research project involving the training and evaluation of both computer and human resource development skills. The study concluded that effective training supervisors were complemented by effective training programs, particularly those which made use of modern technology such as computers. A study aimed at more effective performance in small group discussion compared a





skill training program with an enriched program consisting of the same skill training program and a programmed textbook. Both groups were rated by external judges as having improved more than a control group, although there did not appear to be a significant difference between the two groups. However, it was found that the students in the enriched program, using the programmed text, rated themselves as having improved more than those students in the standard skill training group (Pyke and Neely, 1975). This finding suggested that students may perhaps perceive benefit in the use of programmed instruction.

Programmed instruction has been used to teach specific counselling techniques and attitudes to counselling students. A study by Saltmarsh (1973) used a programmed approach to teach the basic components of empathic skill to counsellor trainees. The conclusion was that programmed instruction was useful and effective with masters level students. Hart (1973) studied the use of a programmed approach to teach the development of counsellor open-mindedness. The study concluded that programmed instruction may have utility in counsellor training programs.

It is clear that the use of programmed instruction in counsellor education is in its infant stage. As such, no definite conclusions can be reached concerning its future role. However, the studies which have been completed thus far have generally concluded that programmed instruction has



demonstrated some potential utility for counsellor training.

CAI is definitely a more powerful medium than programmed instruction. In this study, a CAI program was evaluated in terms of its effectiveness in teaching personality and counselling theory and assisting the professional development of student counsellors through the use of feedback. Although most counsellor training programs tend to focus on the student's practicum experience, Lister (1967) suggested that "...nothing is so practical as a good theory. Theory is a guide for making observations and for interpreting experiences." (P. 91). Thus it can be argued that clear and proper understanding by the student through effective instruction in the various approaches to theories of personality and counselling is an invaluable and necessary part of counsellor training.

Because every counsellor must operate from some theoretical base, counsellor education programs should help the student to make as explicit as possible the theoretical base from which he operates.

The final task of counselling theory then, ...is the explication of his own operating theory by each individual in training. It is at this point that he distills in terms meaningful to himself and communicable to others, the basis of his practice of counselling. At the very least, the neophyte will be able to articulate some hypotheses about human





behavior in general, his own interactional behavior, and effect the direction he will attempt to go in his counselling efforts. The years of his professional practice will consist of a testing and refining of these early formulations. (Penney, 1971, P. 11).

The CAI program used in this study evaluated the potential for assisting this process. If a student's personal relationship to each of the counselling theories which (s)he encounters in his training can be assessed and made clear to him, then it seems probable that the student will be able to more clearly formulate and develop his own counselling orientation. (Lister, 1964; Lister, 1967). Clearly, this involves use of feedback.

The importance of feedback about self for counsellor preparation has been noted by a number of researchers (Matarazzo, 1971; Truax and Mitchell, 1971). Increasing use of feedback for trainees has been made, particularly in the 'systems approach' to counsellor education (Reddy, 1968; Thoresen, 1969; Burck et al, 1973). A study investigating the effects of feedback on beginning counselling students found that it significantly aided in the development of congruence in the perception of self and ideal self. The study concluded that "...feedback be included in counsellor preparation programs so that the prospective counsellor has an opportunity to increase self-awareness and self-understanding." (Borgers, 1975, P. 118). Recently, modern



technology has assisted the procedure of giving student feedback in counsellor education through the use of audiotapes and videotapes (Frankel, 1971; Yenawine and Arbuckle, 1971). No research has been conducted on the ability of CAI to provide feedback for counsellor trainees, although it may have tremendous potential in this regard by being able to record large amounts of student performance data and to use this information for student feedback. This study evaluated CAI as a medium for providing systematic individual feedback in the area of theoretical and counselling orientation for each student.

In summary, the literature suggested a need for effective instruction in counselling theory and for the development of a personal theory and style of counselling by the individual student. Programmed instruction has demonstrated some potential in regard to teaching particular counselling skills. However, CAI can be regarded as showing much more promise in this area by using systematic feedback in order to assist students to develop styles of counselling to later serve them in their professional practice.





## CHAPTER IV

Course Content

The material for the CAI course came from the original writings of Carl Rogers. This included material from his books and many of his journal articles. Because Rogers recently made modifications to his theoretical ideas, the course content emphasized these refinements and reformulations.

The course was divided into two sections of equal length: Rogerian personality theory and client-centered therapy. Each section was broken down into key topic areas. Each of the topic areas was further divided into major concepts. As each of the concepts was presented to the student, examples for the purpose of illustration were included along with questions on the course material. Following is a detailed description of the topics and concepts which comprised the course.

A. Rogerian Personality Theory - Segment 1

## Topic 1: Assumptions about Man

## Concepts:

- i) individual perceptions of reality
- ii) human organism as an organized system
- iii) actualizing tendency
- iv) behavior as goal-directed



## Topic 2: The Phenomenal Field

### Concepts:

- i) definition/description of phenomenal field
- ii) process of perception and symbolization
- iii) development of individual perception of reality

## Topic 3: The Self

### Concepts:

- i) definition of positive regard
- ii) need for positive regard and the self
- iii) positive self-regard
- iv) relationship between positive self-regard and positive regard

## Topic 4: Positive Regard

### Concepts:

- i) definition of positive regard
- ii) need for positive regard and the self
- iii) positive self-regard
- iv) relationship between positive self-regard and positive regard

## Topic 5: Actualization and Self-Actualization

### Concepts:

- i) definition/description of actualizing tendency
- ii) actualizing tendency and the human being
- iii) definition/description of self-actualizing tendency





- 14
- iv) influence of self-actualizing tendency on  
the self

Topic 6: Psychological Adjustment and Maladjustment

Concepts:

- i) role of the self in behavior
- ii) congruency and psychological adjustment
- iii) incongruency and psychological maladjustment
- iv) the self and defensive behavior
- v) effect of incongruency upon behavior
- vi) effect of congruency upon behavior

B. Client-Centered Therapy - Segment 2

Topic 1: General Overview of Client-Centered Therapy

Concepts:

- i) general description of therapy process
- ii) rationale underlying client-centered therapy
- iii) goal of client-centered therapy
- iv) client-centered therapy and incongruency
- v) client-centered therapy and congruency
- vi) if-then hypothesis

Topic 2: Conditions of the Therapy Process

Concepts:

- i) two persons in psychological contact
- ii) client is in state of incongruency
- iii) therapist is congruent in the relationship
- v) role of empathy
- vi) need for communication of these conditions  
to client



### Topic 3: Role of the Therapist

#### Concepts:

- i) emphasis on type of relationship
- ii) development of therapeutic relationship

### Topic 4: Process of Therapy as Experienced by the Client

#### Concepts:

- i) exploring incongruencies
- ii) experiencing of repressed feelings
- iii) discovery of a new self
- iv) experiencing the new self

### Topic 5: Outcomes in Personality and Behavior

#### Concepts:

- i) process continuum
- ii) description of congruent end of continuum
- iii) reduction of need for defensive behavior
- iv) reduction of psychological vulnerability
- v) development of congruency
- vi) increase in self-control and self-confidence

Upon completion of the course, the student was taken to the feedback section (segment 3) which is discussed in more detail in Chapter VI. Following the student feedback a short evaluation of the program was completed by each student. This formed the major part of the evaluation of the effectiveness of this program for counsellor trainees.





## CHAPTER V

Design of the Course

As each student signed on to the course, (s)he was given a short introduction to the use of the computer terminal. Here the student received instruction in how to enter responses to questions presented during the course, using both the lightpen and the keyboard. During the terminal introduction, the program asked for the student's name which was stored and used later throughout the program.

The student was then given a brief introduction to the course itself. This section explained the content of the course, including the various topics in each of the two segments. In addition, the use and nature of the feedback questions asked throughout the program was made clear to the student. Each student was encouraged to enter responses to these questions indicating either a high degree of agreement or disagreement with the Rogerian approach in order to make the feedback more personally meaningful.

During the course introduction, the student was informed that (s)he will have the freedom to choose the topic to be covered next. This degree of learner control was included in the program because the course was intended for graduate students. Such an approach was compatible with the student-centered view of learning as advanced by Rogers:



From a Rogerian point of view, the instructor would have a very important role in creating an atmosphere in which the training takes place, and the student would be as self-determining as possible. From this point of view, a man-machine training system would not replace the student-centered professor, but would greatly extend the implementation of his theories and values (Meany, 1972, P. 120).

The use of learner control was in keeping with Rogers' philosophy in regard to counselor education. Therefore, after the presentation of each major concept within each topic area, the student was given the opportunity to continue to the next concept, to review the concept presented, to go to a glossary of terms, or to go to a new topic area. The number of times a student makes use of the learner control feature was recorded by the program.

Throughout the course, each student was asked a number of questions related to the course material. This program used feedback as a simple means of indicating to the student the extent to which (s)he understands the course material. The student answered questions by typing a response with the keyboard, or by pointing at the answer with the lightpen. The student had to enter a correct response to each question before being allowed to move ahead in the course. The program kept a record of the number of questions to which the student had entered a correct response on the first



attempt. If a student decided to review a concept or topic area, (s)he was not asked to respond a second time to either the course content or the feedback questions.

The feedback questions were presented to the student in combination with the presentation of each major concept. These questions attempted to determine the student's personal relationship to the Rogerian approach in two dimensions:

- i) To what extent does the student agree with this approach.
- ii) To what extent does the student plan to use this approach when counselling.

The student entered a response by pointing along a line representing a continuum ranging from, totally disagree / do not plan to use, to totally agree / plan to use. Each response was evaluated in units of ten, ranging from 0 to 9. The number of such feedback questions asked of each student was recorded by the program.

In the design of the program, some consideration was given to the 'human factor' element. In most cases, the design of man-machine systems has been the sole responsibility of hardware-oriented engineers who often use only economic or physical science criteria, rather than those of a psychologist (Baker, 1971). Failure to realize the importance of this element may lead to difficulties in the implementation of the computer programs:





If the human factor is not properly valued, then morale problems after the system is operational may demand remediation. For example, if the task analysis of personnel in the training system result in overly specific and monotonous tasks, absenteeism turnover, and other problems may result (Meany, 1972, P. 120).

Therefore, the design of this program was influenced by the need to personalize or humanize the nature of the course. For example, throughout the course, the student's first name was used both in screen displays of the course material, and in feedback to student responses. Such a feature also served to hold the student's attention. In addition, the use of humor was incorporated into the program for its value in relieving any student monotony or boredom. For example, cartoon characters such as Charlie Brown were displayed in various places, along with humorous messages. At one point, the computer 'pretended' to forget the student's name. In general, the program was designed to present the course material in a light-hearted fashion, rather than to present it in a dull and dry manner, as is found in much of the programmed instruction texts.



## CHAPTER VI

Feedback Section - Segment 3

The trend in counsellor education programs is toward the increased use of feedback for the individual student. The primary purpose of such feedback is to assist the counsellor trainee to become more aware of his own counselling style. Often, the style of a counsellor trainee is compared to that of a model such as Rogers, Ellis, Perls etc. Similarly, the use of feedback in this program was to allow the student to express his personal attitudes and values in regard to the client-centered approach, thereby permitting the student to become more aware of his personal approach to counselling in relation to that of Rogers. In this way, it can be determined whether or not the student has an affinity for client-centered counselling.

In addition, the student received feedback on various aspects of his performance in the course. Because the learner control feature provided the opportunity for the student to bypass much of the course, the program recorded how much of the course the student had taken and provided this information to the student in terms of a percentage score. The number of times that the student used the branching feature to review or to go to the glossary was revealed to the student. Finally, each student was informed of the percentage of questions (s)he answered correctly on





the first attempt.

The major component of the feedback section concerned how the student's personal counselling orientation was related to that of Rogers. This score consisted of two measures:

- i) to what extent does the student agree with the Rogerian approach to personality and counselling - maximum score of 207
- ii) to what extent does the student plan to emphasize the client-centered approach when counselling - maximum score of 45

Each student could have been asked a total of 23 questions for the first measure and five questions for the second measure. The student was then informed as to how many of each type (s)he had been asked. These questions were presented to the student at the end of most of the major concepts dealt with in the course.

Because no norms were available to determine what would constitute either a high or a low compatibility with the Rogerian approach, it was decided that those students who scored in the top quarter of the total possible received feedback indicating a high agreement with Rogers, and with client-centered therapy. Those students scoring in the bottom third of the total possible received feedback indicating they did not agree strongly with the Rogerian



approach, and that perhaps another style of counselling may be best suited to them. If a student's score indicated little interest in using the client-centered approach, (s)he was asked if there was another approach (s)he would prefer to use in counselling. If so, (s)he was encouraged to pursue it and also to consider incorporating some of the client-centered attitudes such as empathy and unconditional positive regard (Rogers, 1972). For those students whose score did not indicate either high or low compatibility, little feedback was given except to suggest they were not enthusiastic about client-centered therapy. These students were also told how many uncommitted responses they had entered to the feedback questions, if the number was five or greater. Regardless of the type of feedback given, the student was asked if (s)he agreed with it. If a student disagreed with the type of feedback received, (s)he was given the opportunity to make a comment. All the scores on each student were automatically typed out at a typewriter terminal as soon as the student entered the feedback section.

In designing the feedback section, consideration was given to procedures which would minimize defensiveness on the part of the student (Lister, 1967). Therefore, each student, regardless of his personal relationship to the Rogerian counselling approach, was given support for developing his own individual style of counselling. The



feedback section concluded with the program labelling each student's counselling orientation by his last name and affixing the letters '-ian' to the name, and the student was encouraged to develop and function according to this counselling orientation. Thus, for example, a student whose last name is Smith was described as having a Smithian counselling orientation.





## CHAPTER VII

Results

The course ROGER was taken by 48 students. Of the 48 students, 43 completed the course. The sample of 43 students included 25 graduate students who were enrolled in a counselling program and 18 undergraduate students who were registered in an introduction to counselling course. The mean time for all students to complete the program was 108 minutes. The graduate students finished the program in a mean time of 109.25 minutes and the undergraduates completed it in a mean time of 107.96 minutes.

The program recorded the following measures on each student:

- i) amount of course covered,
- ii) number of times branching feature used,
- iii) number of questions answered correctly on the first attempt,
- iv) extent of agreement with Rogerian concepts (roger-1),
- v) desire to use Rogerian counselling approach (roger-2) and



vi) student attitudes toward the program.

The scores recorded on each student are listed in the Appendix. The mean scores for each of these measures are summarized in Table I on page 25.

i) Amount of Course Covered

Most of the students covered all sections of the program. More undergraduate students than graduate students chose to miss some sections of the course. However, the undergraduate students tended to miss fewer sections than did the graduate students. For example, some of the graduate students covered only 60% of the course whereas the minimum amount of the program covered by any of the undergraduates was 88%. These results are summarized in Table II on page 26.

ii) Number of Times Branching Feature Used

The results indicated that this group of students made little use of the branching feature to review or to go to the glossary of terms. The graduate students used this feature a mean of only 2.83 times and the undergraduates used it a mean of 4.78 times.





TABLE I  
MEANS OF STUDENT PERFORMANCE MEASURES  
RECORDED BY CAI PROGRAM ROGER

|                                                                  | Graduate Students | Undergraduate Students | Total           |
|------------------------------------------------------------------|-------------------|------------------------|-----------------|
| i) Percentage of Students Covering All Sections of Program       | $\bar{X}=75\%$    | $\bar{X}=61\%$         | $\bar{X}=69\%$  |
| ii) Number of Times Branching Feature Used                       | $\bar{X}=2.83$    | $\bar{X}=4.75$         | $\bar{X}=3.67$  |
| iii) Percentage of Questions Answered Correctly on First Attempt | $\bar{X}=81\%$    | $\bar{X}=73\%$         | $\bar{X}=77\%$  |
| iv) roger - 1                                                    | $\bar{X}=159.32$  | $\bar{X}=161$          | $\bar{X}=160$   |
| v) roger - 2                                                     | $\bar{X}=36.71$   | $\bar{X}=35.9$         | $\bar{X}=36.4$  |
| vi) Student Attitudes Towards Program maximum=20                 | $\bar{X}=15.17$   | $\bar{X}=15.61$        | $\bar{X}=15.36$ |



TABLE II  
MEAN PERCENTAGE OF CAI PROGRAM ROGER

COVERED BY STUDENTS

|                                                              | Graduate<br>Students | Undergraduate<br>Students | Total          |
|--------------------------------------------------------------|----------------------|---------------------------|----------------|
| i) Percentage of Students<br>Covering all Course<br>Sections | $\bar{X}=75\%$       | $\bar{X}=61\%$            | $\bar{X}=69\%$ |
| ii) Percentage of Course<br>Covered if not<br>Completed      | $\bar{X}=75\%$       | $\bar{X}=92\%$            | $\bar{X}=80\%$ |
| iii) Range of Percentage<br>of Course<br>Completed           | 60%-100%             | 88%-100%                  | 60%-100%       |



iii) Number of Questions answered Correctly on the First Attempt

Approximately 77% of the questions concerning the course material were answered correctly on the first attempt by all students taking the program. Students who missed some of the course sections and were not asked all of the questions in the program received an average of about 67% of the total possible. Students who responded to all of the course material questions answered an average of about 82% of these correctly on the first attempt. Of these students, the mean score for the graduate students was higher than for the undergraduates. These results are summarized in Table III on page 31.

iv) Extent of Agreement With Rogerian Concepts ( roger-1 ).

These results were adjusted for two reasons. If a student's lightpen response was not in the anticipated area of the CRT screen and therefore 'unrecognizable', the program asked the student to point more carefully and to try again. Because of a programming error, it was recorded that the student had been asked two questions rather than two attempts at the same question. Therefore, the actual number of such questions asked each student had to be determined from an analysis of the performance recordings taken on each student. Secondly, students who missed sections of the course were not asked all 23 of these questions. In order to





establish the mean score for this measure, the scores on each student were adjusted as if they had been asked all 23 questions. The adjusted scores indicated the following means for the measure of the students' degree of agreement with Rogerian concepts.

|                        |                  |
|------------------------|------------------|
| all students           | roger-1 = 160.00 |
| graduate students      | rcger-1 = 159.32 |
| undergraduate students | rcger-1 = 161.05 |

v) Desire to Use Rogerian Approach to Counselling ( roger-2 ).

There was no need to adjust this set of scores because every student taking the program was asked all five of the questions designed to assess this measure. The results indicated the following means:

|                        |                 |
|------------------------|-----------------|
| all students           | rcger-2 = 36.40 |
| graduate students      | rcger-2 = 36.71 |
| undergraduate students | roger-2 = 35.95 |

vi) Student Attitudes Toward the Program

In order to evaluate the program from the students' perspective, a five item attitude questionnaire was included at the end of the feedback section. The student responded to each item by pointing the lightpen at one of five choices: poor, not bad, average, good, or outstanding. Each response was assigned a score from 0 (poor) to 4 (outstanding) for a maximum score of 20. These results are summarized in Table IV on pages 32 to 34.



TABLE III  
 MEAN PERCENTAGE OF COURSE QUESTIONS  
 ANSWERED CORRECTLY ON FIRST ATTEMPT

|                                                          | Graduate<br>Students<br>N=24 | Undergraduate<br>Students<br>N=18 | Total<br>N=42  |
|----------------------------------------------------------|------------------------------|-----------------------------------|----------------|
| i) Students Covering<br>All Sections<br>of Course        | $\bar{X}=86\%$               | $\bar{X}=76\%$                    | $\bar{X}=82\%$ |
| ii) Students not Completing<br>All Sections<br>of Course | $\bar{X}=65.5\%$             | $\bar{X}=68.3\%$                  | $\bar{X}=67\%$ |





TABLE IV

## STUDENT ATTITUDES TOWARDS CAI PROGRAM ROGER

Attitude Question 1 : How would you rate CAI as an educational tool?

|                                                           | Graduate<br>Students | Undergraduate<br>Students | Total          |
|-----------------------------------------------------------|----------------------|---------------------------|----------------|
| Mean Rating<br>Maximum=4                                  | $\bar{X}=3.04$       | $\bar{X}=3.39$            | $\bar{X}=3.19$ |
| Percentage of Students<br>Rating Program<br>Above Average | $\bar{X}=80\%$       | $\bar{X}=100\%$           | $\bar{X}=88\%$ |

Attitude Question 2 : How would you rate the manner in which the material in this course was presented?

|                                                           | Graduate<br>Students | Undergraduate<br>Students | Total          |
|-----------------------------------------------------------|----------------------|---------------------------|----------------|
| Mean Rating<br>Maximum=4                                  | $\bar{X}=3.12$       | $\bar{X}=3.17$            | $\bar{X}=3.14$ |
| Percentage of Students<br>Rating Program<br>Above Average | $\bar{X}=80\%$       | $\bar{X}=89\%$            | $\bar{X}=84\%$ |



Attitude Question 3 : How well do you feel that you know Rogerian personality theory and client-centered therapy?

|                                                           | Graduate Students | Undergraduate Students | Total          |
|-----------------------------------------------------------|-------------------|------------------------|----------------|
| Mean Rating<br>Maximum=4                                  | $\bar{X}=2.68$    | $\bar{X}=2.39$         | $\bar{X}=2.56$ |
| Percentage of Students<br>Rating Program<br>Above Average | $\bar{X}=68\%$    | $\bar{X}=39\%$         | $\bar{X}=56\%$ |



Attitude Question 4 : Would you say that taking this course has benefited you?

|                                                     | Graduate Students | Undergraduate Students | Total          |
|-----------------------------------------------------|-------------------|------------------------|----------------|
| Mean Rating                                         | $\bar{X}=3.08$    | $\bar{X}=3.22$         | $\bar{X}=3.14$ |
| Percentage of Students Rating Program Above Average | $\bar{X}=88\%$    | $\bar{X}=100\%$        | $\bar{X}=91\%$ |

Attitude Question 5 : Would you advise other counselling students to take this course?

|                                                     | Graduate Students | Undergraduate Students | Total          |
|-----------------------------------------------------|-------------------|------------------------|----------------|
| Mean Rating<br>Maximum=4                            | $\bar{X}=3.38$    | $\bar{X}=3.44$         | $\bar{X}=3.40$ |
| Percentage of Students Rating Program Above Average | $\bar{X}=83\%$    | $\bar{X}=100\%$        | $\bar{X}=90\%$ |





## CHAPTER VIII

Discussion of Results

An important characteristic of CAI is the provision for the collection of data on each student's performance as the student progresses through a CAI course. Such information is available for use by the instructor, for student feedback, and for research purposes. For example, although the primary purpose of the student measures obtained by this program was for individual feedback, the results permitted examination of differences between the graduate and undergraduate students who took the program. In addition, the use of performance records, which provide an exact and detailed record of each student's performance in the course, greatly facilitated the analysis of the results of this study because, in some cases, programming errors resulted in some distortion of the results. By examining these records, it was possible to correct the results which were in error. The performance recordings were an invaluable aid in determining which parts of the program were poorly designed, particularly in regard to certain question items, and in deciding what improvements should be made.

The average student time to complete the program was approximately 110 minutes. However, some students completed the course in less than one hour while other students took nearly 4 hours. This range of times demonstrates the capacity of CAI to allow for different paces of learning by



the students. The mean time to complete the program was slightly greater for the graduate students. The difference was attributed to the fact that a number of the graduate students took in excess of three hours whereas few of the undergraduates required more than two and one half hours to complete the program.

The results indicated that the program's branching feature was little used by the students. However, examination of the performance recordings revealed that this was due to lack of understanding by many of the students of how to use the branching feature. The instructions given the students stated that if they wished to go to the table of contents, to the glossary of terms, or back for a review, they were to 'type a t', 'type a g', or 'type a b'. The program was designed to check for either t,g, or b and branch the student accordingly. If a student typed anything else, (s)he was taken to the next concept or topic in the course. Many of the students interpreted these instructions too literally and tried to type 'a t' or 'a g' etc. Since the program only checked for t,g, or b, these students were not branched out of the linear sequence but rather continued on to new course material. The performance recordings showed that several of the students attempted to use the branching feature in this manner until they assumed that it was not working properly.

It is obvious that these instructions must be changed





so that they are more clearly understood by the student. A possible solution is to check to see if the student is typing 'a t', etc., and to then explain that it is just necessary to type t. The results indicated that some students used the branching a number of times which suggests that it should be kept as part of the program for those students who would like to make use of this feature. However, more research is required to determine if this aspect of the program is useful and effective from the standpoint of student learning. In response to suggestions made by a number of students, the program will also be modified so that a student will be able to review just the previous screen display at any point in the course, rather than having to review the whole discussion of a concept.

The results showed that approximately 70% of the students chose to cover all sections of the course material, rather than branching out of a topic area before it was completed. This figure may be spuriously high because several of the students were unable to properly use the branching feature. In regard to this measure of the amount of the course covered, the results showed an interesting difference between graduate and undergraduate students. Although a larger proportion of the graduate students covered all sections of the course material, those graduate students not completing the entire program covered less material than the undergraduates who did not complete the



whole program. The present program will be modified to inform the student of any sections of the course which were missed out and to give the student the option of covering the missed sections before completing the program and receiving the final feedback.

Approximately 77% of the questions which dealt with the course material were answered correctly on the first attempt. Undoubtedly, this proportion would have been higher if all students had covered the entire course and had been presented with all of the questions. In calculating a student's percentage of questions answered correctly on the first attempt, the total score possible was used and no allowance was made for those students missing questions because they did not cover the whole course. An analysis of the performance recordings further revealed that some of the questions were poorly presented to the student, resulting in lower scores for some students than should have been the case. For example, in one question three response alternatives were placed on the screen under which was the instruction 'Point to a,b, or c.' A large number of the students pointed to either the a,b, or c in this instruction, rather than one of the choices above it. Because the program was designed to accept a lightpen response only where the choices were located, these students' responses were recorded as incorrect or unrecognizable for their first attempt. Thus, had some of





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the question items been presented more clearly, then the proportion of students responding correctly to these questions may have been even higher.

As might be expected, the graduate students answered more of these questions correctly on their first attempt than did the undergraduates. This was not the case when comparing the two groups which had not covered all sections of the course. The undergraduates tended to miss fewer sections and therefore had more questions presented to them. In general, the results indicated that a large proportion of the questions concerning the course material were answered correctly on the first attempt. Although the question items may have been fairly simple to answer, it is also possible that the course material was well organized and well presented to the students, allowing them to acquire a clear understanding of the various concepts involved. Support for this latter interpretation came from comments by the instructor of the undergraduate class who observed that his students did very well in a classroom written test administered to them about the ideas of Carl Rogers and the level of their classroom conversations about this subject.

The mean agreement score (roger-1) of the students who took ROGER was 160. The program was designed to provide feedback which was in high agreement with Rogers for any student whose score was 155, or 75% of the total score possible based on the number of such questions asked that





student. It was interesting that only one student disagreed with the feedback messages. In regard to the extent to which the student planned to use the client-centered approach, the mean score was 36.4. Students who received a score of 34, or better, received feedback which indicated they planned to use this approach to a significant extent. Again, only two students disagreed with this feedback.

In regard to the measure of extent of agreement with Rogerian concepts, the distribution of scores approximated a normal curve. The two lowest scores were dropped from the analysis because they deviated so greatly from the other scores, although they will be included in the long range development of norms for the program. This was done in order to modify the feedback section and allow the distribution to become approximately normal with a mean of 164 and a standard deviation of 16.49. Sixty nine percent of the scores were within one standard deviation of the mean and 95% within two standard deviations. The distribution of scores of the students' desire to use the Rogerian approach to counselling (roger-2) was not quite as normally distributed as for roger-1 as it was based on fewer observations. A total of 74% of the scores were within one standard deviation of the mean. The distribution was negatively skewed. This suggested that perhaps counselling students tended to want to use the Rogerian approach in their own counselling.



These results permit the future modification of the feedback section of the program based on the distribution of scores in this sample of students. The program was designed to give feedback to students who indicated a high degree of agreement with Rogers if their scores were greater than 155. Since the mean score of the students who took the program was 160, most of them received this type of feedback and only one graduate student disagreed with the feedback received. Clearly, a score of 160 indicated a high degree of agreement with Rogers since it involved assigning a score of at least seven out of a maximum of nine to each of the student's responses to these questions. These scores may have been high because the students were asked at the beginning of the program to 'commit' themselves by pointing at the extreme ends of the disagreement/agreement scale. Since only one student disagreed with this type of feedback, the results indicated that students who received a score of 160 should likely be told that their personal views agreed with Rogers. However, the feedback could also be modified so that they are informed as to where this score places them in relation to other counselling students who have taken the program. The results suggested that counselling students tended to agree with Rogers. Therefore, a high score on this measure did not necessarily indicate an unusually high level of agreement. However, in relation to other counselling students, a score that is not within one standard deviation





of the mean could be considered as an indication of either exceptionally low or high agreement with Rogerian concepts. As a result, the program will be modified to include this type of feedback to the student.

An important implication of these results is that it is possible to develop a CAI program which records certain variables of each student's performance. The results suggest that perhaps some of these variables may be normally distributed in the population of counselling students. The use of such empirical data could greatly facilitate the implementation of appropriate student feedback and assessment procedures by the instructor. This program was designed to record fairly simple and straightforward variables and the results suggested that the program was effective in accomplishing this function, although construct validity has not yet been established for these measures. Perhaps other performance variables will be delineated in the future which will permit a much more functional and effective measurement procedure. The results indicated the possibility of developing norms for the measures recorded by the program. Over the next few years, with a large sample of students, the various student measures will be less regarded as statistics, and more as the parameters of the population of counselling students of the University of Alberta. Further, if future counsellor training programs include a series of similar CAI programs on each of the various



counselling approaches, it would be possible to develop individual student profiles to permit an empirically based assessment of the type or style of counselling to which the individual student seems best suited. In summary, the results of this study have suggested the future possibility of CAI to provide sound, meaningful data which could be used for a variety of purposes in counsellor education.

The results of the student attitude questionnaire clearly indicated that the students favorably viewed the program. On the average, over 80% of the students rated each of the evaluation items as either good or outstanding. The item which received the lowest rank concerned how well the students felt they knew the subject matter; a majority of them felt they knew the subject matter 'better than average.' The two most important items concerning the personal benefit from taking the course and its usefulness for counselling students, were the two items which received the highest ranks.

In conclusion, the results of the student attitude questionnaire revealed the students felt that the course material was well presented, felt that they benefited from taking the course, and that they would not hesitate to recommend this CAI program to other counselling students.



## CHAPTER IX

Conclusions and Recommendations

The purpose of this study was achieved; a CAI program to teach Rogerian counselling theory to counsellor trainees was designed and developed, and then evaluated by a group of students. The results of the study showed that the program was effective both in teaching the course material and in using information about student performance as a means for student feedback. The students expressed a highly favorable attitude towards all aspects of the program. Therefore, one conclusion reached from this study was that this CAI program could be a beneficial addition to a counsellor training program. Similar programs need to be developed to deal with other counselling orientations and topics. Further, more research is required with these types of programs.

As society grows more complex, placing a greater strain on the individuals within it, the need for effective counselling becomes greater. To meet these increasing demands, counsellor education programs must provide improved methods of training. One approach might be to use CAI. This study demonstrated how CAI can assist this process in the following ways:

- i) by effectively teaching personality and counselling theory,
- ii) by allowing the instructor to focus more on experiential and practical learning,





- iii) by systematic use of student feedback, and
- iv) by providing an excellent medium for research purposes.

It is recommended that counsellor educators begin to make use of the potential afforded by CAI.

This study demonstrated that CAI can be used to effectively present course material to the student in a detailed and well organized manner which suggests that other programs could be developed to instruct counselling students in a number of counselling theories and topics. Research is needed to determine if CAI can perform this function as well, or better, than the lecture approach. Further, the study demonstrated that a CAI course could also include a detailed and precise monitoring of each student's performance during the course. This simply can not be equalled by the traditional lecture and examination approach. The use of performance records proved to be extremely important in deciding what areas of the program required improvement. In this way, the quality of any CAI program could be continually upgraded.

The significance and potential of the measurement component of this program proved to be the most exciting aspect of the study to this author. The CAI course ROGER demonstrated that certain variables of each student's performance could be recorded, that student norms could be



established and continually upgraded, and that this information included in such empirical data could be effective in increasing self-awareness of one's counselling style. Research is now required to establish construct validity for the measures recorded by ROGER so that it can be determined that the program does, in fact, measure 'agreement with Rogers'. Although this study focused upon one counselling approach, it is strongly recommended that similar CAI programs be developed for each of the major counselling orientations. Upon completion of a series of such programs by a broad range of counselling students, it might be possible to develop individual student profiles indicating the degree of personal relationship between the student and each of the major counselling approaches encountered in the standard counsellor training program. These profiles might be based on empirical data and, as a result, could prove to be highly beneficial both for purposes of student feedback and research.

From the results of this study, it is recommended that CAI programs of this design be used for further research in counsellor education. This program demonstrated how CAI can be used to gather data on the characteristics of counsellor trainees as well as information about the differences between the graduate students and undergraduate students who took the program. It is recommended that programs of this nature be used to identify any meaningful differences





between student counsellors and counselling psychologists who are working in the field. One of the student measures recorded by ROGER concerned the extent of agreement with Rogerian concepts. In regard to this measure, it would be interesting to identify any meaningful differences between a group of students who take the course before the start of their counselling training, and a group of students who take the course after having completed their training. Such research might determine if exposure to a number of counselling orientations before taking the ROGER program would result in a decreased tendency to agree with or plan to use the Rogerian approach to counselling. It is strongly recommended that a long term research study be established to set up expectancy tables involving student measures or profiles on counsellor training courses administered via CAI and, later counselling style after working in the field for a number of years. As well, CAI is a suitable medium for studying the effect of such course design variables as learner control and positive feedback.

In summary, the primary purpose of this study was the development and evaluation of a CAI program for counsellor education. This goal was accomplished. It is recommended that more research be carried out with ROGER to gather information as to the long term implications for counsellor education. This study has concluded with something of lasting and practical value: an operational CAI program for



counsellor education. However, research on the possible effects of such programs has barely begun.



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## APPENDICES



| STUDENT<br>NUMBER | AMOUNT OF<br>COURSE COVERED | RECORDED SCORES - GRADUATE STUDENTS |                                    |         |         | PROGRAM<br>EVALUATION |
|-------------------|-----------------------------|-------------------------------------|------------------------------------|---------|---------|-----------------------|
|                   |                             | TIMES BRANCHING<br>FEATURE USED     | CORRECT RESPONSES<br>FIRST ATTEMPT | ROGER-1 | ROGER-2 |                       |
| m804              | 60%                         | 2                                   | 65%                                | 103     | 31      | 16                    |
| m805              | 100%                        | 0                                   | 74%                                | 167     | 37      | 15                    |
| m806              | 84%                         | 8                                   | 74%                                | 74      | 27      | 9                     |
| m807              | 84%                         | 10                                  | 72%                                | 51      | 13      | 10                    |
| m808              | 100%                        | 3                                   | 88%                                | 151     | 42      | 17                    |
| m813              | 100%                        | 0                                   | 79%                                | 159     | 35      | 12                    |
| m833              | 100%                        | 0                                   | 83%                                | 172     | 40      | 17                    |
| n117              | 100%                        | 1                                   | 69%                                | 164     | 28      | 15                    |
| n118              | 100%                        | 4                                   | 86%                                | 160     | 38      | 16                    |
| n119              | 100%                        | 0                                   | 88%                                | 161     | 39      | 16                    |
| n120              | 100%                        | 1                                   | 86%                                | 160     | 37      | 17                    |
| n121              | 100%                        | 0                                   | 79%                                | 167     | 34      | 18                    |
| n122              | 100%                        | 0                                   | 95%                                | 182     | 43      | 19                    |
| n125              | 100%                        | 0                                   | 67%                                | 172     | 39      | 14                    |
| n126              | 100%                        | 0                                   | 81%                                | 189     | 44      | 17                    |
| n129              | 100%                        | 4                                   | 90%                                | 157     | 37      | 18                    |
| n130              | 100%                        | 2                                   | 67%                                | 122     | 29      | 12                    |
| n131              | 100%                        | 2                                   | 79%                                | 186     | 44      | 18                    |
| n132              | 92%                         | 5                                   | 86%                                | 177     | 39      | 15                    |
| n133              | 72%                         | 14                                  | 55%                                | 118     | 41      | 16                    |
| n135              | 60%                         | 13                                  | 39%                                | 109     | 40      | 9                     |
| n136              | 100%                        | 1                                   | 76%                                | 176     | 39      | 18                    |
| n138              | 100%                        | 0                                   | 83%                                | 158     | 37      | 16                    |
| n140              | --                          | -                                   | --                                 | 90      | 36      | 15                    |
| n143              | 100%                        | 0                                   | 88%                                | 161     | 41      | 14                    |





# RECORDED SCORES - UNDERGRADUATE STUDENTS

| STUDENT<br>NUMBER | AMOUNT OF<br>COURSE COVERED | TIMES BRANCHING<br>FEATURE USED | CORRECT RESPONSES<br>FIRST ATTEMPT | ROGER-1 | ROGER-2 | PROGRAM<br>EVALUATION |
|-------------------|-----------------------------|---------------------------------|------------------------------------|---------|---------|-----------------------|
| n225              | 100%                        | 3                               | 81%                                | 181     | 41      | 19                    |
| n226              | 100%                        | 2                               | 81%                                | 169     | 37      | 14                    |
| n227              | 100%                        | 4                               | 60%                                | 127     | 29      | 13                    |
| n228              | 96%                         | 6                               | 83%                                | 172     | 43      | 15                    |
| n229              | 100%                        | 1                               | 67%                                | 151     | 32      | 14                    |
| n230              | 100%                        | 12                              | 86%                                | 170     | 38      | 14                    |
| n231              | 88%                         | 3                               | 79%                                | 170     | 38      | 16                    |
| n233              | 100%                        | 2                               | 83%                                | 163     | 40      | 15                    |
| n234              | 100%                        | 2                               | 79%                                | 143     | 31      | 17                    |
| n235              | 88%                         | 4                               | 55%                                | 132     | 38      | 19                    |
| n237              | 100%                        | 1                               | 79%                                | 146     | 36      | 19                    |
| n238              | 88%                         | 2                               | 74%                                | 134     | 30      | 15                    |
| n239              | 92%                         | 16                              | 41%                                | 114     | 36      | 14                    |
| n240              | 100%                        | 9                               | 69%                                | 143     | 38      | 16                    |
| n241              | 96%                         | 4                               | 72%                                | 159     | 36      | 14                    |
| n242              | 100%                        | 1                               | 69%                                | 178     | 34      | 16                    |
| n243              | 100%                        | 2                               | 81%                                | 166     | 33      | 17                    |
| n244              | 96%                         | 6                               | 74%                                | 158     | 35      | 14                    |

## APPENDIX B



Course Name : ROGER 55  
Segment : 1  
Date : DECEMBER 21, 1976

CAI COURSE DOCUMENTATION

1. Abstract of Segment contents: THE COURSE MATERIAL IS ROGERIAN  
PERSONALITY THEORY
2. Film Reel Used: # - NONE
3. Master Audio Tape Used: # - NONE
4. Minimum Execution Time: 20 mins. ; Maximum: 150 mins; Average: 60 mins.
5. Level(s) of Instruction:
  - SENIOR UNDERGRADUATE
  - GRADUATE SCHOOL
6. Instruction Logic Used:
  - LEARNER CONTROL
  - TUTORIAL
  - TESTING
7. State References of Published Results:
  - A CAI PROGRAM FOR COUNSELLOR EDUCATION (1977)
8. If this segment is used as part of a course listed in the  
University Calendar, give the official calendar name:  
Ed Psych 411 and Ed Psych 512
9. Pre-Course Instruction Requirements:
  - NONE
10. List special student passwords, if any, with their label-sequence.
  - NONE
11. List proctor messages, if any, with their label-sequence and the  
corrective actions if required.
  - NONE
12. Is the segment designed so that performance records can be analyzed?  
YES X NO
13. Title and Location of Manual, if required:
  - NONE



14. If special equipment is required, what and where is it?

- NONE REQUIRED

15. Author: JAMES J. ROWAND Address: 14008-86<sup>th</sup> Ave., EDMONTON

16. Programmer: JAMES J. ROWAND Address: 14008-86<sup>th</sup> Ave., EDMONTON

17. What should the system latency time be set to? - NO SPECIAL TIME

18. Availability for duplication and distribution:

- REQUIRE CONSENT OF AUTHOR

19. Availability for use by others on the DERS CAI facility:

- REQUIRE CONSENT OF AUTHOR

20. Additional notes:

- ENSURE RECORDS ARE KEPT OF STUDENT SCORES  
FOR PURPOSES OF ESTABLISHING NORMS





Course Name : ROGERSegment : 2Date : DECEMBER 21, 1976CAI COURSE/DOCUMENTATION

## 1. Abstract of Segment contents:

THE COURSE MATERIAL IS CLIENT-CENTERED THERAPY

2. Film Reel Used: # - NONE3. Master Audio Tape Used: # - NONE4. Minimum Execution Time: 20 mins.; Maximum: 90 mins.; Average: 60 mins.

## 5. Level(s) of Instruction:

- SENIOR UNDERGRADUATE
- GRADUATE SCHOOL

## 6. Instruction Logic Used:

- TUTORIAL
- LEARNER CONTROL
- TESTING

## 7. State References of Published Results:

- A CAI PROGRAM FOR COUNSELLOR EDUCATION (1977)

## 8. If this segment is used as part of a course listed in the University Calendar, give the official calendar name:

Ed Psych 411 and Ed Psych 512

## 9. Pre-Course Instruction Requirements:

-NONE

## 10. List special student passwords, if any, with their label-sequence.

- NONE

## 11. List proctor messages, if any, with their label-sequence and the corrective actions if required.

- NONE

## 12. Is the segment designed so that performance records can be analyzed?

YES XNO     

## 13. Title and Location of Manual, if required:

- NONE



14. If special equipment is required, what and where is it?

- NONE REQUIRED

15. Author: JAMES J. ROWAND Address: 14008-86<sup>th</sup> Ave., EDMONTON

16. Programmer: JAMES J. ROWAND Address: 14008-86<sup>th</sup> Ave., EDMONTON

17. What should the system latency time be set to? - NO SPECIAL TIME

18. Availability for duplication and distribution:

- REQUIRE CONSENT OF AUTHOR

19. Availability for use by others on the DERS CAI facility:

- REQUIRE CONSENT OF AUTHOR

20. Additional notes:

- ENSURE RECORDS ARE KEPT OF STUDENT SCORES  
FOR PURPOSES OF ESTABLISHING NORMS



Course Name : ROGERSegment : 3Date : DECEMBER 21, 1976CAI COURSE DOCUMENTATION

## 1. Abstract of Segment contents:

THIS SEGMENT GIVES THE STUDENT FEEDBACK AS TO PERFORMANCE  
IN THE COURSE AND STYLE OF COUNSELLING

2. Film Reel Used: # NONE3. Master Audio Tape Used: # NONE4. Minimum Execution Time: 2 mins.; Maximum: 10 mins; Average: 4 mins.

5. Level(s) of Instruction:

- SENIOR UNDERGRADUATE
- GRADUATE SCHOOL

6. Instruction Logic Used:

- FEEDBACK

7. State References of Published Results:

- A CAI PROGRAM FOR COUNSELLOR EDUCATION (1977)

8. If this segment is used as part of a course listed in the University Calendar, give the official calendar name:

Ed Psych 411 and Ed Psych 512

9. Pre-Course Instruction Requirements:

- NONE

10. List special student passwords, if any, with their label-sequence.

- NONE

11. List proctor messages, if any, with their label-sequence and the corrective actions if required.

- STUDENT SCORES SENT TO TYPEWRITER AT START-14

12. Is the segment designed so that performance records can be analyzed?

YES XNO     

13. Title and Location of Manual, if required:

- NONE





14. If special equipment is required, what and where is it?

- NONE REQUIRED

15. Author: JAMES J. ROWAND Address: 14008-86<sup>th</sup> Ave., EDMONTON

16. Programmer: JAMES J. ROWAND Address: 14008-86<sup>th</sup> Ave., EDMONTON

17. What should the system latency time be set to? - NO SPECIAL TIME

18. Availability for duplication and distribution:

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**B30172**